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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,795	07/30/2003	Nickolaos Pilatis	84800 3017 KAW	9410
20736	7590	10/06/2006	EXAMINER	
MANELLI DENISON & SELTER 2000 M STREET NW SUITE 700 WASHINGTON, DC 20036-3307				KIM, TAE JUN
ART UNIT		PAPER NUMBER		
3746				

DATE MAILED: 10/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/629,795	PILATIS ET AL.
	Examiner Ted Kim	Art Unit 3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 01 August 2006.
- 2a) This action is **FINAL**.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 4,6 and 11-15 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-3,5,7-10 and 16-22 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) All    b) Some \* c) None of:  
1. Certified copies of the priority documents have been received.  
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 07/30/2003
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 4, 6, 11-15 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 08/01/2006. Claims 11-13 have been indicated as reading on the designated species but have been withdrawn from further consideration as they read on the species of Figure 5.

### ***Drawings***

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 45 (see page 8, line 20). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3, 5, 7-9, 17, 18, 20-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Joshi et al (5,638,682) and Joshi et al (5,251,447). Joshi et al '682, in combination with the incorporated by reference (see col. 2, lines 45-48; col. 3, lines 13-17) Joshi et al 5,251,447 patent, teach a prefilmer for a fuel injection arrangement of a gas turbine engine comprising a body having a fluid flow surface 38 and a downstream edge, the prefilmer arranged so that when working in operative association with the fuel injection arrangement fuel from 65 (see the Joshi '447 patent and note that the fuel is liquid) flows over the surface to the downstream edge, from where the fuel is shed, characterised in that the prefilmer further comprises a fluid flow mixing means (slots 70 or the portions of 36 between the slots) to, in use, enhance the mixing of fuel and air; characterised in that the fluid flow mixing means comprises projections (the portions between the slots) extending generally downstream from the downstream edge; characterised in that the projections are generally trapezoidal in shape (see e.g. Figs. 4, 5); characterised in that projections are radially inwardly angled (see Fig. 5 the portions between the slots); characterised in that the projections are radially outwardly angled (see portion 75 of slots 70; characterised in that the projections are alternately radially inwardly and outwardly angled (alternatingly the portions between the slots are radially

inwardly and the portions 75 of the slots are outwardly angled); characterised in that the prefilmer is generally annular; characterised in that the surface is an inner surface of the prefilmer and the fluid flow mixing means is disposed to the inner surface; characterised in that during low fuel flows the fluid flow mixing means enhances the mixing of fuel and air and inherently provide regions of rich and lean fuel/air mixtures.

5. Claim 1, 17-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Vickery (2,982,098). Vickery teaches a prefilmer for a fuel injection arrangement of a gas turbine engine comprising a body 24 having a fluid flow surface and a downstream edge near 34, the prefilmer arranged so that when working in operative association with the fuel injection arrangement fuel flows from 54 over the surface 24 to the downstream edge, from where the fuel is shed, characterised in that the prefilmer is generally annular; characterised in that the surface is an inner surface of the prefilmer and the fluid flow mixing means is disposed to the inner surface; characterised in that the surface is an outer surface of the prefilmer and the fluid flow mixing means is disposed to the outer surface; characterised in that during low fuel flows the fluid flow mixing means enhances the mixing of fuel and air and inherently provide regions of rich and lean fuel/air mixtures.

6. Claims 1-3, 7, 17, 18, 20-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Chyou et al (5,498,155). Chyou et al teach a prefilmer for a fuel injection arrangement comprising a body having a fluid flow surface and a downstream edge, the prefilmer arranged so that when working in operative association with the fuel injection arrangement fuel flows from 25 (col. 5, lines 20-24) over the surface to the downstream

edge, from where the fuel is shed, characterised in that the prefilmer further comprises a fluid flow mixing means 9 to, in use, enhance the mixing of fuel and air; characterised in that the fluid flow mixing means comprises projections extending generally downstream from the downstream edge; characterised in that the projections are generally trapezoidal in shape (see the portion of 9 connected to 21 is illustrated as trapezoidal); characterised in that projections are radially inwardly angled; characterised in that the projections are radially outwardly angled; characterised in that the projections are alternately radially inwardly and outwardly angled; characterised in that the fluid flow mixing means is asymmetrically arranged about the prefilmer; characterised in that the prefilmer is generally annular (col. 5, lines 51+); characterised in that the surface is an inner surface of the prefilmer and the fluid flow mixing means is disposed to the inner surface; characterised in that during low fuel flows the fluid flow mixing means inherently enhances the mixing of fuel and air and provide regions of rich and lean fuel/air mixtures.

7. Claims 1-3, 7, 8, 16, 17, 19-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Markowski et al (3,974,646). Markowski et al teach a prefilmer for a fuel injection arrangement comprising a body having a fluid flow surface and a downstream edge, the prefilmer 40, 30 arranged so that when working in operative association with the fuel injection arrangement fuel from 48 flows over the surface to the downstream edge, from where the fuel is shed, characterised in that the prefilmer further comprises a fluid flow mixing means 60 (Fig. 3) or projections 54b, 54c (Fig. 5, which are asymmetrically spaced) to, in use, enhance the mixing of fuel and air; characterised in

that the prefilmer is generally annular; characterised in that the surface is an outer surface of the prefilmer and the fluid flow mixing means is disposed to the outer surface of 30; characterised in that during low fuel flows the fluid flow mixing means inherently enhances the mixing of fuel and air and provide regions of rich and lean fuel/air mixtures.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 2, 8, 17, 19, 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crocker et al (6,272,840) in view of Markowski et al (4,260,367). Crocker et al teach a prefilmer for a fuel injection arrangement comprising a body having a fluid flow surface and a downstream edge, the prefilmer arranged so that when working in operative association with the fuel injection arrangement fuel flows over the surface to the downstream edge, from where the fuel is shed, that the prefilmer is generally annular; characterised in that the surface is an inner surface of the prefilmer. Crocker et al do not teach a fluid flow mixing means to, in use, enhance the mixing of fuel and air.

Markowski et al teach a fluid flow mixing means 52 to, in use, enhance the mixing of fuel and air characterised in that the fluid flow mixing means comprises projections extending generally downstream from the downstream edge 52 which are radially

outwardly angled and which enhance mixing and reduce emissions (col. 1, lines 33-39).

It would have been obvious to one of ordinary skill in the art to apply projections extending generally downstream from the downstream edge 52 which are radially outwardly angled and which enhance mixing and reduce emissions. The analogous location of Crocker would be clearly be the prefilmer based on the similarity of the swirler configurations. During low fuel flows the fluid flow mixing means will inherent enhance the mixing of fuel and air and provide regions of rich and lean fuel/air mixtures.

10. Claims 1, 3, 5, 7-9, 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Markowski et al (3,974,646) as applied above, and further in view of Young (3,153,319). Markowski et al teach one kind of mixing means with a lobe mixer but not with projections. Young et al show a lobe mixer 13 and various equivalent ways of mixing including radially inward and outward projections (Figs. 12), inward trapezoidal projections with trapezoidal (Figs. 7 or 15) notches between. It would have been obvious to one of ordinary skill in the art to employ the equivalent projection configurations, as taught by Young et al, as equivalent known in the art.

11. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over any of the above applied art in view of Larson et al (4,284,170). The above prior art teaches projections but not those which are asymmetrically spaced. Larson et al teach an asymmetric arrangement of the projections 16 is well known in the art and destroys the unsteady pressure field when two flow streams commingle (see abstract). It would have been obvious to one of ordinary skill in the art to employ an asymmetric arrangement of

the projections in order to enhance mixing and/or destroy the unsteady pressure field when two flow streams commingle.

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax number for the organization where this application is assigned is 571-273-8300.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444. Alternate inquiries to Technology Center 3700 can be made via 571-272-3700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>

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